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Furthermore, the saving of time and printer's ink would amount to something in a word so often used.

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FROST IN CALIFORNIA

TO THE EDITOR OF SCIENCE: In a recent issue of SCIENCE mention was made of the effect of a recent freeze upon the vegetation of southern California resulting in the destruction of many introduced varieties, including some very large trees.

The writer has been considerably interested in observing the effect of the freeze in this section, especially upon the different varieties of trees. Immediately following the freeze it did appear that many of the trees were probably killed. Peppers, eucalyptus, acacias and grevilleas among the larger trees suffered severely. Trees two to three feet in diameter and from twenty-five to thirty years old in some cases had the bark split clear to the wood almost from top to bottom of the tree. The bark turned black clear to the wood and great masses of it could be split off easily. Supposing that trees in such condition were certainly dead scores of them were cut down at once. Wiser counsel was to delay operations until opportunity was given to see what the outcome might be.

One can scarcely conceive what such a loss means to a community such as this, where shade means so much and where such magnificent results have been obtained. Some of our streets were lined with rows of eucalyptus from 75 to 150 feet high. Many of these have been cut down. Subsequent results show that delay in cutting and pruning was the wiser course in this instance, for, incredible as it may seem, many of the trees which had their bark split and turned black and loosened from the wood seem to have begun to develop a new bark, or in many cases the old bark seems to be reuniting with the wood and leaves and branches are being put forth.

I do not believe a single pepper of any size perished. In fact it seems to the writer that in their new coat of green they look brighter and fresher than ever.

Some of the acacias and grevilleas were probably killed, but I visited an acacia just recently which two weeks ago one would certainly have pronounced dead. The bark was split and loosened from the trunk and dry as tinder, the limbs were bare and brittle and dry enough to burn, but to my surprise when last I saw it here and there along the trunk the bark seemed to be reforming and green shoots a foot or more in length had grown. It looks as if with judicious pruning and care the tree might be made to live, though probably hideously deformed.

Perhaps the most surprising results are to be observed among the eucalyptus trees. Some varieties have suffered severely. The sugar gum (*E. cornocalyx*), lemon gum (*E. citriodora*), *E. robusta* and *E. calyophylla* suffered considerably. The blue gum, *E. globulus*, was injured in some localities. *E. amygdalina* was not injured at all.

The surprising feature in every case is the formation of a new bark or the rejuvenation of the old. Trees on which the bark was split and black and loosened from the wood now have bark green and full of sap and firmly united to the wood. The branches are for the most part dead, except the very large ones, and stand out bare and brown. The trunk and larger branches are covered almost from top to bottom with a new extremely dense growth of adventitious branches, thickly covered with leaves, giving the tree a peculiar fuzzy appearance.

Judging from the recovery of trees which two months ago were apparently lifeless, I believe it is safe to say that very few trees which were more than two or three years old and in a fairly healthy condition when the freeze came need have been cut. Judicious pruning will later be necessary.

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SCIENTIFIC BOOKS

Anleitung zur Kultur der Mikroorganismen.
Von ERNST KÜSTER. 2d edition. Leipzig
and Berlin, B. G. Teubner. 1913.

Professor Küster, now of Bonn, prepared this compact little book of about 200 pages as a result of his long experience in training students at the Botanical Institute of Halle. It is neither a text-book nor a laboratory manual of the ordinary kind, including a definite course of study, but a reference compendium of technique including "the most important culture methods for all groups of microorganisms." The conception is an excellent one and Professor Küster has carried it out well.

The book is about equally divided between a general and a special part. The general part includes sections on water and glass, on liquid and solid media, sterilization, types of cultures, isolation and pure cultivation, inoculation, atmospheric conditions, temperature, light, evaporation, transpiration and cultivation in agitated or flowing media, detection and effects of waste products, operation of poisons, microbiological analysis and auxanography and the preservation of cultures. The special part includes sections dealing, respectively, with protozoa in general, with flagellata, with myxomycetes, with algæ, with fungi and with bacteria.

Two things are particularly notable about this book, its scholarly tone and the breadth of the field covered. Although the treatment is necessarily very condensed and no attempt is made to discuss with any fullness the philosophical problems involved, yet such fundamental questions as the effect of water upon glass, the physical and chemical characters of culture media and the study of waste products are discussed in a spirit which should prove enlightening to the American student who is too often superficially trained to use a few arbitrary methods without knowing or caring for underlying reasons. The other special virtue of the book is the attention to groups other than the commonly studied pathogenic forms. Special media are described, for example, for the cultivation of fat-splitting bacteria, the acetic acid bacteria, butyric acid bacteria, the nitrifying and denitrifying bacteria, the sulphur bacteria and the purple bacteria. Nine pages are devoted to the Protozoa, fifteen to the Algæ and thirty-nine to the

Fungi. In general, citations of the literature dealing with technical procedures are full and valuable although American and English methods are neglected. It is strange to find no reference to the Hesse and Hiss and North media or to the extensive work done on standard methods of water examination. For German work, however, the book seems very comprehensive and as a reference source for dealing with any of the more unfamiliar groups of microbes it should prove invaluable in any laboratory.

C.-E. A. WINSLOW

AMERICAN MUSEUM OF NATURAL HISTORY

Catalogue of the Collection of Birds' Eggs in the British Museum. Vol. V., Carinatae (Passeriformes completed). By W. R. OGILVIE-GRANT. 1912. Pp. xxiii + 547; Pls. XXII.

With the issue of the present volume the British Museum has brought to a successful conclusion the publication of another series of their splendid catalogues, which, while in most cases professing only to be records of their own collections, become in effect world records of the subjects covered. Ornithology has been especially favored with these reviews, the "Catalogue of Birds" (27 volumes, 1875-1895), the "Hand-list of the Genera and Species of Birds" (5 volumes, 1899-1909), and the "Catalogue of Birds' Eggs" (5 volumes, 1901-1912) being absolutely indispensable sources of reference to all working ornithologists who would make pretense to more than local studies. The first British Museum publication on birds' eggs was a small work by G. R. Grey, issued in 1852, but this was merely an enumeration of the eggs of British birds, and has long been obsolete. The national collection of eggs continued to grow, both by donation and purchase, and by 1900 had long passed the 50,000 mark, making it in many respects the foremost collection in the world. In preparing the exposition of this wealth of material the trustees of the museum were fortunate in securing the services of Mr. E. W. Oates, who is well known as the author of several of the bird volumes of the "Fauna of British India," and as the editor of the second